European Research Studies,
Volume XI, Special Issue (3-4) 2007

Demographic Changes in transition countries: Opportunity or Obstacle for Economic Growth? Case of Montenegro

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Abstract:

Demographic changes have aroused considerable anxiety in transition countries, affecting fiscal policy, labor markets, investment and savings behavior.

Montenegro faces an aging population, falling fertility rates, low income per capita, low savings rate and a national budget constrained by fiscal deficits, escalating social costs, and foreign debt service problem. Devising a viable solution for the economic and social welfare of current and future generations is critical.

Keywords: *Aging, Labor market structure, Fiscal policy, Economic Growth*

JEL classification : J 11, O 15

1. Introduction

This paper focuses on demographic changes in Montenegro and other transition countries, its future trends and impact on economic performance. In the first part, we review literature explaining demographic changes and their impact on economic performance. This is followed by an analysis of demographic changes in transition countries and their special problems. These problems are then placed in the context of theoretical and practical ideas and solutions available in the literature.

Demographic changes occurred in Montenegro will be analyzed in detail. A hundred year projection of demographic structure will show future trends.

In the final part, we show that the demographic structure has a strong impact on economic performance in Montenegro. In order to provide sustainable economic growth in transition countries, current and future demographic issues have to be seriously considered in defining economic strategies for the economic and social welfare of current and future generations.

2. The relationship that exist between demographic changes and economic growth – literature review

Analysis of the impact of demographic structure on economic growth is not new.

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> "Adam Smith claimed that growth was related to the division of labor, but he did not link them in a clear way. Thomas Malthus developed a formal model of a dynamic growth process in which each country converged toward a stationary per capita income. According to his model, death rates fall and fertility rises when income exceeds the equilibrium level, and the opposite occurs when income is less than that level. Despite the influence of the Malthusian model on nineteenth-century economists, fertility fell rather than rose as income grew during the past 150 years in the West and other parts of the world. The neoclassical model of growth responded to the failure of the Malthusian model by essentially ignoring any link between population and the economy" (Becker, Murphy, Tamura, 1990).

Birsdail (1977) reviews principal analytical approaches to the study of the relationship between population growth and economic development over the 50's and 60's. She argues that the sustained economic growth of Western Europe and North America during the eighteen and nineteenth centuries was accompanied by the first steady and sustained increase of population the world had ever seen. A growing population has been proffered as a net contributor to economic growth because of its stimulating effect on demand and its risk-reducing incentive to investment; it provides for constant improvement of the labor force with better-trained workers and because population pressure may encourage technological innovation, particularly in agriculture. Moreover, large population size permits economies of scale in production for larger markets.

After World War II mortality rates declined dramatically and population growth accelerated in poor countries. Birsdail argues that:

> "If population growth had seemed to be directly related to economic progress in Europe and North America, it now seemed inversely related to the economic prospects of India, China and Latin America. Population growth is no longer seen as an unequivocal benefit. The situation in the post-war developing world was different from that in industrializing Europe in a number of significant ways. Governments in the post-war epoch must be more responsive to education, health, and even income standards for their population. Today's developing countries must achieve growth in the face of the competition from already modernized countries. Most important, population in poor countries is growing at least twice as fast as it was in Europe in the 18th century, at rates of 2-3% a year, in contrast to at most 1%. The result is that the age composition in developing countries, where as much as half the population is in the young, non-productive groups, is much less favorable to production and proportionally more burdensome with respect to consumption and social overhead investment."

These unprecedented rates of population growth, while will cause the population to double every 20-30 years, has brought attention from economists. The analytical models of Nelson (1956) and Leibenstein (1954) reintroduced population as an endogenous variable influenced by income. Their models were Malthusian.

A seminal contribution to the analysis of the consequences of population growth was the work of Coale and Hoover (1956). Constructing a mathematical model of the economy of India, they made projections of per capita income under low, medium and high (exogenous) fertility assumptions. Over the years, many of their assumptions and results have been challenged, but the importance of their work was that reawakened economists and others to the demographic factor as a policy variable, rather than an exogenous variable.

Other significant studies projected costs of growing population in specific areas as education, health services; to analyze labor market, consequences of rapid population growth for the balance of payments, future supply of food, general availability of physical resources, etc. (Birsdail, 1977)

By the end of 20th century, most developed countries were faced with aging population. This attracted attention of economists again, and new research attempted to analyze impact of aging population on economic performance in developed countries. (Cutler, Poterba, Sheiner, Summers, Akerlof, 1990). These studies argued that aging population have a negative impact on: (a) saving (as older persons dissave); (b) ratio between productive and unproductive groups, which if not compensated for by increased productivity, may influence per capita income, fiscal revenues, etc; (c) fiscal policy, through increase in social security spending

3. Demographic Trends in Transition Economies

South-East Europe countries (SEE) and Former Soviet Union States (FSU), belong to the group of countries with lower medium income (Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Macedonia, Romania, Russia and Serbia and Montenegro), or higher medium income countries (Croatia, Czech republic, Estonia, Hungary, Latvia, Lithuania, Poland and Slovak republic).[2]

From demographic perspective (i.e. Theory of Demographic Transition), most of these countries have approached the post-transition phase (zero rates of population growth) or even the future-declining phase (negative population growth rates). Both phases are followed by a period of aging population, where become intense when a country approaches the future-declining phase. Of these countries, only Albania has high population growth rates (transition stage in the theory of demographic transition).

Table 1: Basic demographic indicators of transition countries in Europe

[2] World bank classification: countries were divided among income groups according to 2002 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income, $735 or less; lower middle income,$736–2,935; upper middle income, $2,936–9,075; and high income, $9,076 or more.

	Country	Income group[3]	Population (million)			Average annual population growth %		Crude mortality rate	Crude birth rate	Natural increase (per 1000 persons)
			1980	2001	2015	1980-2001	2001-15	2001	2001	2001
1	Albania	LMI	2.7	3.2	3.6	0.8	1.0	6.0	17.0	11.0
2	Armenia	LMI	3.1	3.8	4.0	1.0	0.3	7.0	11.0	4.0
3	Belarus	LMI	9.6	10.0	9.3	0.2	-0.5	14.0	9.0	-5.0
4	Bosnia and Herzegovina	LMI	4.1	4.1	4.4	0.0	0.5	8.0	12.0	4.0
5	Bulgaria	LMI	8.9	8.0	7.3	-0.5	-0.7	14.0	9.0	-5.0
6	Macedonia	LMI	1.9	2.0	2.2	0.4	0.4	8.0	13.0	5.0
7	Romania	LMI	22.4	22.4	21.4	0.0	-0.3	12.0	10.0	-2.0
8	Russia	LMI	139.0	144.8	134.5	0.2	-0.5	16.0	9.0	-7.0
9	Serbia and Montenegro	LMI	9.8	10.7	10.7	0.4	0.1	11.0	12.0	1.0
10	Croatia	HMI	4.6	4.4	4.2	-0.2	-0.3	11.0	9.0	-2.0
11	Check Republic	HMI	10.2	10.2	9.9	0.0	-0.2	11.0	9.0	-2.0
12	Estonia	HMI	1.5	1.4	1.3	-0.4	-0.5	14.0	9.0	-5.0
13	Hungary	HMI	10.7	10.2	9.4	-0.2	-0.6	13.0	10.0	-3.0
14	Latvia	HMI	2.5	2.4	2.1	-0.4	-0.7	14.0	8.0	-6.0
15	Lithuania	HMI	3.4	3.5	3.4	0.1	-0.2	12.0	9.0	-3.0
16	Poland	HMI	35.6	38.6	38.4	0.4	0.0	9.0	10.0	1.0
17	Slovakia	HMI	5.0	5.4	5.4	0.4	0.0	10.0	10.0	0.0
										0.0
	World		**4,429.6**	**6,130.1**	**7,093.9**	**1.5**	**1.0**	**9.0**	**21.0**	12.0
	Low Income		1,613.4	2,505.9	3,090.9	2.1	1.5	11.0	29.0	18.0
	Lower-Medium Income (LMI)		1,626.4	2,163.5	2,413.0	1.4	0.8	8.0	17.0	9.0
	Higher-Medium Income (HMI)		362.4	503.6	588.1	1.6	1.1	7.0	20.0	13.0
	Europe and Central Asia		425.8	474.6	476.6	0.5	0.0	12.0	12.0	0.0
	High Income		827.4	957.0	1,001.9	0.7	0.3	9.0	12.0	3.0
	EMU		286.7	306.7	306.0	0.3	0.0	10.0	10.0	0.0

Source: World Development Report (2003), World Bank

Empirical evidence shows that countries, which are in the post-transition demographic phase, are at the same time at a very high level of economic development (high income countries). Developing countries (lower and higher medium income group) are normally in the transition demographic phase. Based on such scenarios, models, policies and practice concerning economic development, fiscal policy, financial system, social security, etc. have been developed.

The situation in transition countries is quite different. While demographic trends in some transition countries would attribute the pattern of high-income country, these transition countries are lower medium income countries. Further, average GDP growth rates in these countries during the last decade have been negative.

But which models and policies are most applicable in Montenegro and other transition countries? Models that are usually applied to developing countries, with low or

[3] World bank classification: countries were divided among income groups according to 2002 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income, $735 or less; lower middle income, $736–2,935; upper middle income, $2,936–9,075; and high income, $9,076 or more.

medium level of income, assume high population growth rates, high fertility rates and low mortality rates. Models applicable to developed countries assume low population growth rates and high income level. Neither model is applicable, as the quantitative structure of population has an impact on structure and size of production, consumption, savings, investment, government spending and revenues.

While the moderately growing population will have a positive net impact on economic growth, an aging population will have a negative impact on the labor supply, saving, fiscal revenues, and a positive impact on social security expenditures.

The size of the problem is negatively correlated with the level of per capita income. Higher income countries have more tools and instruments to cope with these problems, while in lower income countries set of available tools and instruments is limited.

Why are transition countries facing this problem? Under centrally planned system (socialism) (the first 30 years), economic growth rates were positive and income per capita grew. This influenced the demographic structure, moving these countries toward low fertility and mortality rates. After the failure of socialism, all these countries faced economic brake-down and recession, followed by a decrease in per capita income and negative output growth rates. While the economic situation changed significantly, moving these countries to lower levels of income, the demographic trends remained the same. The outcome is lower income but "high" stage in demographic development; a scenario that has not been analyzed in literature. Consequently, transition countries are facing huge problems. While this paper focuses on Montenegro, similar problems exist in all lower-middle income transition countries that are in the post-transition demographic stage. Analysis based on Montenegro's case shows that the current and future demographic structure is more an obstacle than a source of economic growth. Indicators in other transition countries show that similar conclusions may be implied to them as well.

4. Population in Montenegro during the last century

Population in Montenegro doubled, from 311 thousands in 1921 to 658 thousands in 2001. Average age increased from 27.3 (1921) to 32.53 (1991) and than to 35 (2001). The aging index (ratio of population older than 60 to the population younger than 20) more than doubled, from 21.1 (1921) to 56.6 (2001). In 1991, the total dependency ratio, representing number of dependants (sum of children and aged people) per hundred working age people was 51.24, while the child dependency ratio was 38.85 and aged dependency ratio was 12.39. The average annual population growth rate from 1921-1991 was 0.89%. At the same time, older population groups have grown faster than younger population groups. Since the institutional transition started (1989), average annual population growth in Montenegro has been 0.67%, while in the world it was 1.63%, in developing countries 1.93% and in developed countries 0.54%. Later we will see that the population will continue to age and the dependency ratio will increase further.

The demographic trends in Montenegro are also found in many other countries. According to the Rowland, (2003), who cited the World bank, the total dependency ratio in the more developed world will increase from 50 in 1990 to 71 in 2050. The aged

dependency ratio will increase from 18 to 41, while the child dependency ratio will decrease from 32 to 30 as result of the lower fertility rate.

The fertility rate in Montenegro decreased from 5.1 (1921) to 1.7 in 2001. The low fertility rate in 2001 was the result of high economic and political instability, a low level of income, high costs of rising children and developed instruments for family planning. In our projections, we will use 1991 census data, as those reflect population in Montenegro more accurate. 2001 fertility statistics were biased by political and economic temporary shocks (Balkan wars and high political instability). Also, if similar shocks repeats in the future and fertility rates decline below 1991 level, it will be signal for policy makers to introduce adequate population policies, as child-bearing support, which will increase fertility.

5. Population in Montenegro (1991-2091)

Based on cohort components method, the population in Montenegro was estimated up to 2091. As a base, 1991 census data were used, as those are the latest available census data. Some more recent demographic indicators, as fertility and mortality rates were available, but in order to avoid data time-inconsistency and biasness caused by temporary shocks, we decided to use 1991 census data.

Basic assumptions for projections: specific age fertility rate and specific age death rate were assumed to be constant during next century. Absolute specific age net migrations were assumed to be negative and fixed until 2026 (while relative specific age net migration (net migration rate) decreased constantly due to increasing specific age population), and than are equal to zero. Constant absolute specific age net migration, under growing population, provides declining relative specific age net-migration rates[4]. Negative net migration rates were evidenced in Montenegro in periods of economic and political instability, particularly at the end on XX century. It is natural to assume that such migration trends will continue as long as instability exists, with declining trends strongly correlated with increasing stability. Similar experience was evidenced in other transition countries. Korcelli's research had shown that: "Since 1989, as a consequence of rapid political and economic change toward democracy and market economy, the level of emigration from Poland has decreased".

Zero rates of net migration rely on the optimistic scenario of economic and institutional development in Montenegro in next two decades, despite the fact that demographic components will be more of an obstacle than the source of such trends. If, instead of assuming zero a specific net migration rate starting in 2026, we assume negative rates to continue, the demographic structure of a population will shift so that unproductive groups dominate even more.

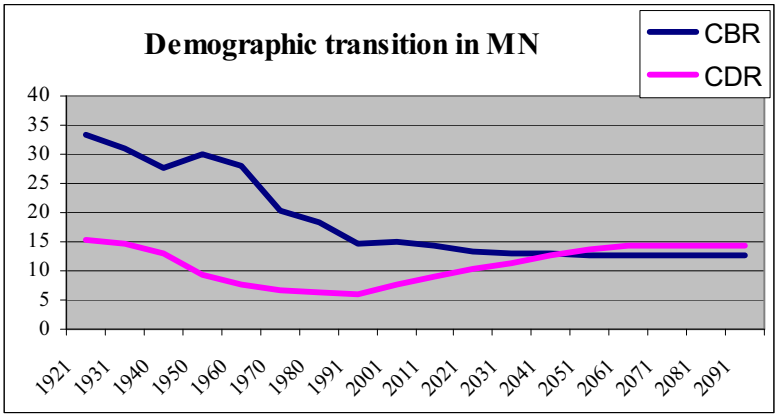
Table 2. Population in Montenegro 1991-2091 (cohort model projections)

[4] Alternative approach to define assumptions for net-migration is to assume non-fixed absolute specific net-migration. But, as international migration statistics for the last decade in Montenegro is not completely reliable, there is possibility that absolute specific net-migrations are higher than reported. If that is so, than assumption that absolute net-migration will change may violate accuracy of projections, as underreported present figures will cause underestimated projected figures. As more accurate approach, we decided to use fixed absolute specific net-migration rates, which will, under growing population, result in declining specific net-migration rates.

Montenegro		Annual Growth	Average Annual	Annual Births	Annual Deaths	Annual Natural	CBR	CDR
Year	Population	Rate %	Increase			Increase		
1991	609,113		0					
1996	633,945	0.80	4,966	9,627	4,421	5,206	15.2	7.0
2001	657,227	0.72	4,656	9,882	4,986	4,896	15.0	7.6
2006	678,277	0.63	4,210	10,096	5,646	4,450	14.9	8.3
2011	695,781	0.51	3,501	10,102	6,361	3,741	14.5	9.1
2016	708,612	0.37	2,566	9,859	7,053	2,806	13.9	10.0
2021	718,257	0.27	1,929	9,596	7,427	2,169	13.4	10.3
2026	725,267	0.19	1,402	9,503	7,861	1,642	13.1	10.8
2031	730,965	0.16	1,140	9,528	8,388	1,140	13.0	11.5
2036	733,803	0.08	568	9,535	8,967	568	13.0	12.2
2041	733,901	0.00	20	9,446	9,427	20	12.9	12.8
2046	731,688	-0.06	-443	9,302	9,745	-443	12.7	13.3
2051	727,901	-0.10	-757	9,183	9,940	-757	12.6	13.7
2056	723,092	-0.13	-962	9,121	10,082	-962	12.6	13.9
2061	717,507	-0.15	-1,117	9,082	10,199	-1,117	12.7	14.2
2066	711,542	-0.17	-1,193	9,023	10,216	-1,193	12.7	14.4
2071	705,556	-0.17	-1,197	8,934	10,132	-1,197	12.7	14.4
2076	699,822	-0.16	-1,147	8,838	9,985	-1,147	12.6	14.3
2081	694,194	-0.16	-1,126	8,758	9,883	-1,126	12.6	14.2
2086	688,438	-0.17	-1,151	8,694	9,845	-1,151	12.6	14.3
2091	682,590	-0.17	-1,170	8,632	9,802	-1,170	12.6	14.4

At the beginning of 21st century, Montenegro is approaching a post-transition demographic era, characterized by almost an equal crude birth rate and crude death rate, and both slightly higher than 10 per thousand people. The post-transition period should end in the fifth decade, when the "future declining" period starts with a constant decline in population, low fertility rates and aging.

Graph 1: Demographic Transition in Montenegro: 1921-2091



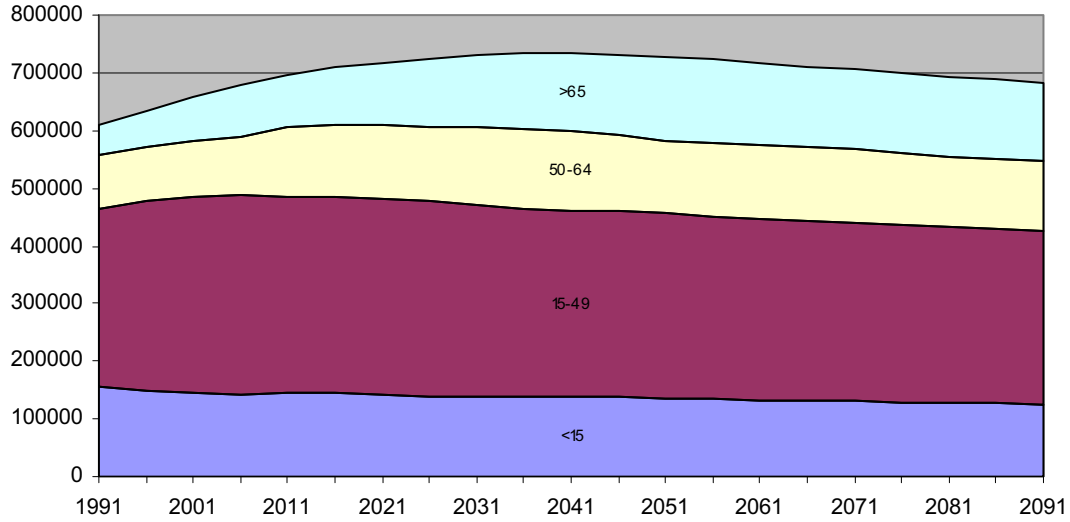
5.1. Age structure of population in Montenegro

While age structure in Montenegro in 1991 (2001) can be described as "mature", the age structure projected for 2051 can be defined as "old". "Mature" populations are

those where the transition from young to old people has started, but still, the percentage of children is high. On the other hand, "old" describes a "rectangular age profile with similar numbers or percentages in each age group up to those where mortality is high. An "old" population is indicative of low birth and death rates." (D. Rowland, 2003)

When the population is described as "mature" but going to become the "old", it means that the population is aging. Aging is the result of fertility decline, followed by low death rates of the older population.

Graph 2: Age structure in Montenegro: 1991-2091



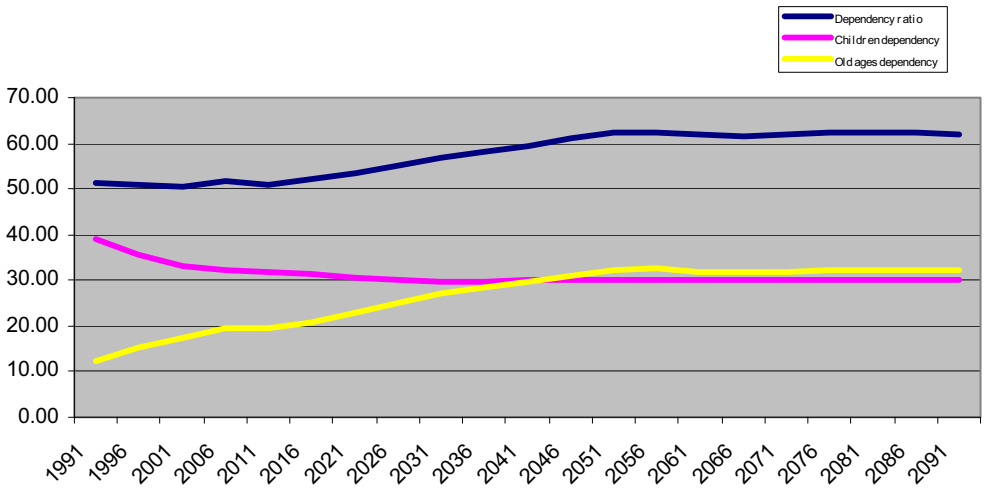
5.2. Dependency ratio

Dependency ratios provide summary measures of age composition, with particular reference to relative number of "unproductive-dependants" and "productive-supporters" groups. The ratios are based on a division of the age range into three broad groupings: children (0-14), working age (15-64) and elderly (65 and over). (D. Rowland, 2003)

The child dependency ratio represents the number of children per hundred working age persons. The aged dependency ratio is the number of elderly people per hundred working age people. **The total dependency ratio** represents number of dependants (sum of children and elderly) per hundred working age people.

The total dependency ratio is expected to grow from 51.24 (1991) to 59.56 (2041) and than to 62.07 (2091). Growth in the total dependency ratio is mostly influenced by an increase in aged dependency ratio, which is expected to increase from 12.39 (1991) to 32.08 (2091). The child dependency ratio will probably decrease due to the low fertility rate and decrease in births over time.

Graph 3: Dependency ratio in Montenegro: 1991-2091



The total dependency ratio in more developed countries in 2050 is projected to be 71 (in 1990 it was 50), while in less developed countries to 54 (in 1990 – 67). (D. Rowland, 2003) Demographic trends in Montenegro have been more comparable to developed countries, due to fact that both have been in the same stage of demographic transition.

6. Impact of Demographic Changes on Economic growth

Institutional restructuring or the transition from centrally planned to a market oriented economy started in Montenegro in 1989[5]. The transition process was interrupted in 1991 due to political instability in the region (Balkan wars), which continued trough 1998. Institutional and economic reforms have focused on establishing a free-market, private-property economy in an effort to create a base for economic recovery and growth.

After more than a decade, Montenegro is still carrying out reforms. Vukotic and Bacovic, (2003) argue that: "At the same time, the economic situation continues to be unstable, with external, fiscal and internal macroeconomic disequilibria, and modest GDP growth rates. Large state-owned companies (electricity, telecommunication, non-metal processing industry, transportation, public services as education, health and administration, etc) are still significant source of domestic income (more than 60%). Private companies are mostly engaged in trade, tourism and agriculture and are the main source of economic growth. Productivity and economic efficiency of most non-privately owned companies continued to decline."

According to the Business Environment Survey (2003)[6], the basic determinants of business conditions in most companies are: the large debts for large companies and lack of financial sources for small companies (this is followed with high interest rates); Over-employment, particularly in large, privatized and state owned companies; Lack of quality workers, especially evidenced in privatized and mixed-ownership companies; Lack of managerial skills; Cost of doing business (taxes and contributions); Legislation (frequent

[5] Montenegro is small economy, with population of 660 thousands in 2001. It is one of six Former Yugoslavia Republics. Today it is part of the Union of States of Serbia and Montenegro.
[6] For detailed report, visit www.visit-ceed.org

changes in the legal and regulatory environment and inefficiency of commercial courts); Political situation; Administrative barriers; Unfair competition and existing monopolies.

Other than these factors, important social and demographic determinants that impact institutional reforms and economic performance:

- Prevailing culture (informal rules)[7]. S.Pejovich (2003) defines culture "as a synthesis of the community's traditions, customs, moral values, religious beliefs, and all other informal norms of behavior that have passed the test of time and bind the generations". Conflict between the prevailing culture in a country and the behavioral incentives of the formal institutions of capitalism, increases the transaction costs of enforcing and maintaining those institutions. The rising strength of anti-free-market political parties and groups in many C&EE countries provides evidence that the prevailing culture in the region is not in harmony with the basic institutions of capitalism. Of course, the higher the cost of enforcing new rules, the weaker the enforcement. Indeed, anti free-market political parties and groups have succeeded in weakening the enforcement of new rules in many C&EE countries. (S.Pejovich, 2003)

- Demographic structure. In this paper we will assume that productive groups are those aged from 15-64 (potential labor force) while unproductive are those aged from 0-14 and 65+. This is not quite precise definition of productive/unproductive people, as significant percentage of people aged from 15-64 may be unproductive-dependants. But in order to simplify the analysis in this paper, the assumption will be accepted, also as it is not going to change direction of demographic trends and its impact on economic efficiency.

Demographic structure and changes influence economic performance, but the causality can also take the opposite direction. Low income per capita has a strong impact on the fertility rate, due to the inability of parents to cover expenditures related to children. Female participation in the labor force is high which is an additional constraint on the fertility rate. High unemployment and low wages influence emigration to more developed countries, especially of educated and young persons. This has negative impact on labor market structure, human capital and overall economic performance. Less significant is the impact on mortality rates, which have not changed significantly due to public health services provided by the state.

To illustrate the impact of demographic structure on economics and institutional restructuring, we take the pension and tax system in Montenegro as an example. Similar model could be used to illustrate the impact on GDP per capita, savings and many other components.

The pension system in Montenegro is still based on "generation solidarity (pay as you go)" which means that current pensions are financed from contributions of currently employed workers. Pensions are a legal obligation of the state and pensioners are legally entitled to receive a monthly payment. This payment is not determined by current pension contributions, but rather the contributions made by pensioners during his (her) working life adjusted by the real growth rate of net wages.

[7] For more, see: Pejovich Svetozar:"Why is culture important", Preduzetnicka ekonomija, Vol II (2003)

No matter what current revenues the pension fund receives, the state pension fund is obliged to pay pension to all pensioners. In Montenegro, revenues from pension contributions finance at most 60% of benefits, while the other 40% is provided through other tax revenues and transfers to the government from abroad. Since the growth in average wage per worker automatically causes an adjustment in the benefits, the ratio of workers to pensioners is a key determinant of the relationship between revenues and obligations for benefits.

$$PR_t = f(L_t, p_t, W_{avg,t}) = L_t \cdot p_t \cdot W_{avg,t}$$

where PR_t is the revenue of the pension fund in period t, L_t-number of employees paying pension contribution in period t, p_t-pension contribution rate and $W_{avg,t}$ be the average gross wage in period t, which is also the basis for calculate future pension contributions.

On the other side, expenditures of the pension fund can be expressed as:

$$PE_t = f(R_t, P_{avg,t}) = R_t \cdot P_{avg,t}$$

where PE_t is the expenditures of pension fund in period t, R_t-number of pensioners entitled to receive regular monthly pension and $P_{avg,t}$-average pension in period t.

If we assume that in the future pension fund revenues and expenditures have to be balanced:

$$PR_t = PE_t$$
$$L_t \cdot p_t \cdot W_{avg,t} = R_t \cdot P_{avg,t}$$

If we know that $W_{avg,t}$ and $P_{avg,t}$ are strongly positively correlated, than we may conclude that any change in p_t will be determined by change in the ratio of R_t and L_t.

$$\Delta p_t = \Delta \frac{R_t}{L_t}$$

An increase in the number of pensioners, while L_t is constant, will force p_t to increase, while an increase in L_t if R_t is constant, will make it possible to decrease.

What determines number of employees? While the number of employees in an economy cannot theoretically exceed the number of 15-64 population, there are other factors as well. A significant percentage of the 15-24 age group do not actively participate in the labor force due to education. Other demographic characteristics of 15-64 population are significant as well, as gender and education structure.

The stock of human capital of those aged from 15-64 will determine also their productivity, reflected through wages.

Present taxes and contributions are high in Montenegro and should be reduced. Current overall taxes and contributions for labor (paid by employees and employer) are approximately 100% of net wage. According to a survey of managers, taxes and

contributions should not exceed 50.8% of net wage, and this is the level that will provide necessary conditions to increase economic efficiency and force development of the company[8].

The current pension contribution rate in Montenegro is 39.12% of the net wage (24% of the gross wage). It is the key component of the taxes and contributions for labor, so we analyze possibility to decrease it by 50%, as managers believe would be economically reasonable.

We did a simple estimation, based on empirical data from Montenegro. Instead of use the average net wage, we used the average gross wage and appropriate pension contribution rate (24%) in order to comply with accounting standards in Montenegro. Also, we assumed a constant average gross wage and constant expenditures from the pension fund (constant number of pensioners)[9]. Based on combination of different pension contribution rates and number of employees, we constructed a pension "budget" line, representing possible combinations of pension contribution rates and number of employees, which will result in constant pension fund revenues under constant wages.

As expected, the pension budget line is a downward sloping curve. In order to reduce pension contribution rate by 50%, the number of employees must increase by 100%. The average exponential growth ($r = \frac{\ln(\frac{P_n}{P_0})}{n}$) of the number of employees necessary to substitute decrease in pension contribution rate by 1% is 5%.

Does Montenegro have demographic potential to increase the number of employees by 100%? Yes, but have to use full demographic capacities in productive purposes in order to provide resources and conditions for economic recovery.

Even if Montenegro finds a way to have fully employed its potentially active labor force, there is still a problem. Projections show that the number of people in productive groups will decline, while the number of people over 65 will increase. This means that potential number of tax payers (or pension contribution payers) will decrease further while the number of pensioners will increase. It will make the pension budget more unbalanced and put more fiscal pressures on productive groups.

Policy makers need to find a solution to avoid these obstacles coming from demographic structure and changes. The most often heard recommendation is to modify the pay-as-you-go system, to change the formula for average nominal growth of the pensions, breaking the starting relationship between wages and pension benefits. Montenegro has decided to adopt the so-called "Switzerland adjustments system under pay-as-you-go pension scheme". Under this system average pensions will increase more slowly than wages, by introducing a new method to calculate average pension growth rate. Pensions would than grow by a factor which is influenced 50% by real wage growth rate and 50% by inflation rate. This creates the possibility to provide faster growth in pension revenues than expenditures whenever the nominal growth rate of wages is higher

[8] Center for Entrepreneurship and Economic Development: *Business Environment Survey (2003)*, Podgorica, Montenegro (www.visit-ceed.org)

[9] As projection shows, number of pensioners will increase, but also average gross wage may increase. In order to simplify analysis, constant wages and number of pensioners are appropriate assumption, as it wont change answer on primary question asked – By which rate employment should increase in order to provide basis to decrease pension contribution rate so revenues will remain the same.

than inflation. Faster growing revenues will make it possible to reduce the pension contribution rate, even if the number of employees remains the same. But, a precondition for real wage growth is increase of productivity, which is determined by the level of technology and the stock of human capital. Both are at very low levels in Montenegro. But, if taxes are high, there are no incentives to invest. Here we have determinately a sort of circle. A possible way is to create privately funded pension system, where the Government won't have any obligations to finance pensions. Individuals will make than their own savings decisions. But still, we cannot simply jump from one institutional solution to the other, nor can we forget about all pensioners from current pension system. Who will finance this? Pensioners themselves? Tax payers? Current workers? Donors? Answer to this question should be objective of another research paper. In this paper we only use this as an example of factors affect economic development.

Conclusion

An aging population, low fertility rates and negative net migration are factors in Montenegro and other transition countries. Population projections show that in the future, population growth rates will be even lower and possibly even negative, while population will continue to age and the dependency ratio will increase.

An aging population has a negative impact of the labor market structure, saving rate and fiscal system. The negative impact on GDP growth may be moderated through increased productivity.

The demographic structure in Montenegro is very similar to the structure of higher income countries. While more developed countries have more resources to cope with problems coming from demographic changes, low per capita income, high unemployment, fiscal deficit constraints and high social costs in transition countries do not provide an environment in which economic and social well-being of the aging population may be easily achieved. As Montenegro is lower-medium income country, the same economic policies that have been introduced in higher income countries are not appropriate. Also, resources available for investment in new technologies are limited, which makes increased productivity more difficult.

Devising a viable solution for the economic and social welfare of current and future generations is critical and demographic problems make implementation more difficult.

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